

- d''*. Interscapulio dorsoque chalybeo-viridibus: uropygio et supracaudalibus purpurascensibus vix chalybeo aut chalybeo-viridi nitentibus: abdomine purpureo, hypochondriis æneo-purpureis *purpurascens*.
- e''*. Tergo rubescenti-purpureo: uropygio dorso concolore, vix chalybeo, sed minime viridi lavato.
- e'''*. Tergo vix chalybeo-purpureo lavato: abdomine sordide rubescenti-purpureo aut æneo-purpureo *porphyronotus*.
- d'''*. Tergo rubescenti-purpureo, unicolore.
- c⁴*. Corporis lateribus æneo-viridibus: abdomine cuprescenti-viridi *minor*.
- d⁴*. Corporis lateribus chalybeis vel chalybeo-viridibus *vulgaris, æstiv.*
- b*. Pileo dorsoque concoloribus *unicolor*.
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XLVI.—*On a Breeding-colony of Larus eburneus on Spitsbergen.* By Professor ROBERT COLLETT, Zoological Museum, Christiania.

(Plate XIII.)

IN August 1887 Capt. Johannesen, master of one of the Norwegian Arctic traders, passed Cape Smith, the easternmost point of north-eastern Spitsbergen, and one which has only been reached in summers exceptionally free from ice. On the small island of Stor-oën, lying about 16 English miles to the east of Cape Smith, in 80° 9' N. lat., he discovered a colony of *Larus eburneus*, and as it was easily accessible, and he had not previously succeeded in examining one, although he had seen several in Tsfjorden and in other parts of Spitsbergen, he made a short stay at the island in order, if possible, to obtain eggs and young, which he knew would of interest.

On the 8th of August, when he visited the island, he found young birds in all stages, from newly hatched to fully fledged, together with a small number of eggs, which, however, were on the point of hatching, and in all probability not one would have been left a week later. Captain Johannesen brought with him to Tromsö 19 eggs and one nest, together

with two old birds and three young in down, which were all acquired by Herr Foslie, curator of the Tromsø Museum, to which he subsequently presented all except a few eggs.

The nidification of *L. eburneus* is as yet but imperfectly known, as, up to the present time perhaps, on only two occasions have authenticated eggs been obtained. On June 18th, 1853, Capt. (now Sir Leopold) M'Clintock, R.N., found a pair breeding at Prince Patrick's Island, one of the Parry group, south-west of Grinnell Land, in $77^{\circ} 25' \text{ N. lat.}$, $116^{\circ} \text{ W. long.}$ (Ibis, 1866, p. 217). The nest was near the beach, and contained one egg, which is preserved in the Dublin Museum. The nest is described as being chiefly formed of moss, with a feather or two, and down. In July 1861, at Murchison Bay, in $80^{\circ} \text{ N. lat.}$, on the west side of north-eastern Spitsbergen, Professor Malmgren discovered a colony breeding in a steep perpendicular limestone cliff, from 50 to 150 feet above the sea. On July 30th he obtained from this colony two of the lowest nests, each of which contained one egg much incubated, now preserved in the Riks-Museum, Stockholm. The nests, placed on the ledges of the rocks, were 6 to 9 inches in depth and composed of dry plants, grass, moss, &c., and a few feathers. I have considered that an account of the materials brought home by Capt. Johannesen would not be without interest, and Herr Foslie, at my request, has forwarded the chief part of them for examination, further placing at my service the particulars obtained from Capt. Johannesen respecting the situation of the breeding-place, &c. I am also indebted to my friend Mr. Landmark for assistance in measuring and describing the eggs, and to Dr. Kiär for determining the species of mosses of which the nest consisted. Stor-oën is about 9 English miles in length and 6 in breadth; the greater part of its surface is covered by a glacier, which rises to a height of about 400 feet; the remaining portions consist of sand and gravel, with here and there small stones, likewise oases covered with moss; while in a few places the ground consisted only of rock.

L. eburneus was breeding on the N.E. side of the island,

close to, or only a short way above, high-water mark, on low-lying ground like *L. canus*, *L. fuscus*, &c., and not in the cliffs. Capt. Johannesen estimated the number of nests at from 100 to 150; they were somewhat apart, at distances varying from two to four yards.

As previously mentioned, on the 8th of August the eggs had been hatched in most of the nests; only in about a fourth of them were eggs still to be found. There were one or two eggs or young but never more in a nest. On being examined at Tromsö it was found that all the 19 eggs contained almost fully developed young chicks. Many of the nests contained young of various ages, whilst others were already empty. Several black-spotted young, capable of flight were seen, likewise several young birds of the previous year's brood remained on the breeding-ground.

The nest is composed chiefly of green moss, which forms about nine tenths of its mass: the rest consists of small splinters of drift-wood, a few feathers, single stalks and leaves of algæ, with one or two particles of lichen. No trace of straw is to be found; a couple of pebbles may possibly have appertained to the under-layer of the nest. The mosses occur in pieces the size of a walnut, or less, and have evidently been plucked in a fresh state from a dry subsoil, either on rocks or gravelly places. They belong to the following species:—*Ceratodon purpureus*, Brid., *Webera cruda*, Schimp., *Catascapium nigritum*, Brid., *Racomitrium lanuginosum*, Brid. (with short teeth, not ciliae, in the margin of the leaves behind the tip), *Hypnum uncinatum*, Hed., and var. *gracillimum*, Bergg., *Hypnum turgescens*, Schimp., and *Orthothecium strictum*, Lor. The mosses are all sterile. Several of the splinters of drift-wood were found of a length of about 100 millim. Under the microscope they all proved to be of conifers, probably Larch, drifted from the Siberian rivers. Some were very old, others, however, being still hard, and possessing a fresh appearance. The feathers, of which only a few were found, are snowy white, and have probably fallen from the brooding bird. Some portions of the algæ were dry crumpled leaves and stalks of seaweed. Only a few bits

of a lichen were found, which appear to have got in accidentally.

The average of nine eggs was 59·9 millim. in length by 33·7 millim. in breadth. The ground-colour of five specimens is almost entirely alike, viz. a light greyish-brown tint, with faint admixture of yellowish green, such as often appears on the eggs of *L. canus*, which, however, have often a deeper brown or green hue. In structure and gloss all nine eggs greatly resemble those of *L. canus*; but the granulations under the microscope are a little coarser, more uneven, and in larger numbers; on the other hand the granulations are perceptibly finer than in *L. fuscus*. The eggs are easily distinguished from those of *Rissa tridactyla* by their greater gloss, and the small excrescences do not lie quite so crowded, and are a little more flattened than they usually are in the last-mentioned species.

Newly hatched young in down: length of tarsus 17 millim., middle toe with claw 24 millim. White all over; the down white to the root. Even in this first stage, the young in down may be distinguished from the young of other species by the strong and hooked claws, especially on the hind toe, the somewhat margined web on the toes, and the forward nostrils. The downy covering is particularly close; *L. eburneus* in this respect is more closely related to the other species of *Larus* than to *Rissa*, the hair-like tips being shorter. The bill is horny brown with lighter margins; the claws light horn-colour. In a somewhat older bird the length of the tarsus is 25 millim., middle toe with claw 31 millim.; the tips of the feathers appear on the shoulders, which exhibit a broad dark-brown transverse band within the white and still down-bearing tips; the bill is horn-brown, with but slightly lighter tip and edges. On account of the long claws the emargination of the web appears to be larger than it really is.

